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ABSTRACT

This report compares the research methods, provider and patient characteristics, and outcome results from four large-scale followup studies of drug treatment during the 1990s: (1) the California Drug and Alcohol Treatment Assessment (CALDATA); (2) Services Research Outcomes Study (SROS); (3) National Treatment Improvement Evaluation Study (NTIES); and Drug Abuse Treatment Outcomes Study (DATOS). The first two studies were, respectively, state and national level stratified random probability samples of provider and patients, and the latter two were prospective repeated interview designs focusing on urban networks. All studies received multistage response rates of about 60%, except DATOS, which achieved about 40%. From before treatment to after treatment, each study revealed across-the-board positive changes in drug use, crime, and health status. Clients in SROS shows consistently fewer changes than others on comparable variables, something that may result from its longer reference periods and the lower precision of the variables selected to measure long-term change. Researchers should further the potential of these large data sets to capture differences in client populations, organization of services, and clinical practices that may explain differential outcomes and costs. An appendix describes the NTIES. (Contains 16 exhibits and 9 references.) (Author/SLD)

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PROSPECTIVE AND RETROSPECTIVE STUDIES OF SUBSTANCE ABUSE TREATMENT OUTCOMES: METHODS AND RESULTS OF FOUR LARGE-SCALE FOLLOW-UP STUDIES

July 1999

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PROSPECTIVE AND RETROSPECTIVE STUDIES OF SUBSTANCE ABUSE TREATMENT OUTCOMES: METHODS AND RESULTS OF FOUR LARGE-SCALE FOLLOW-UP STUDIES

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July 1999

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TABLE OF CONTENTS

Page

FOREWORD i

ACKNOWLEDGMENTS ii

ABSTRACT iii

I. INTRODUCTION 1

II. METHODOLOGICAL COMPARISON 2

1. CALDATA 2

2. SROS 6

3. NTIES 8

4. DATOS 10

5. CONCLUSION 13

III. PUBLISHED DATA ON PROVIDER AND PATIENT CHARACTERISTICS 15

1. SOURCES OF REVENUE 15

2. CLIENT INVOLVEMENT IN TREATMENT GOALS 15

3. STABILITY OF OWNERSHIP OR ADMINISTRATION 16

4. DEMOGRAPHICS OF CLIENTS 16

5. CONCLUSIONS 18

IV. DRUG USE OUTCOMES 19

1. MARIJUANA 20

2. COCAINE 22

3. HEROIN 24

TABLE OF CONTENTS (CONTINUED)

Page

V. OTHER OUTCOMES 28

1. CRIMINAL ACTIVITY 28

2. EMPLOYMENT AND WELFARE 30

3. PHYSICAL AND MENTAL HEALTH 33

VI. IMPLICATIONS FOR TREATMENT RESEARCH, POLICY AND PRACTICE 38

REFERENCES 41

APPENDIX: DESCRIPTION OF THE NATIONAL TREATMENT IMPROVEMENT EVALUATION STUDY AND CENTER FOR SUBSTANCE ABUSE TREATMENT DEMONSTRATIONS (1990-1992)

FOREWORD

The Center for Substance Abuse Treatment (CSAT) works to improve the lives of those affected by alcohol and other substance abuse, and, through treatment, to reduce the ill effects of substance abuse on individuals, families, communities, and society at large. Thus, one important mission of CSAT is to expand the availability of effective substance abuse treatment and recovery services. To aid in accomplishing that mission, CSAT has invested and continues to invest significant resources in the development and acquisition of high-quality data about substance abuse treatment services, clients, and outcomes. Sound scientific analysis of this data provides evidence upon which to base answers to questions about what kinds of treatment work best for what groups of clients, and about which treatment approaches are cost-effective methods for curbing addiction and addiction-related behaviors.

In support of these efforts, the Program Evaluation Branch (PEB) of CSAT established the National Evaluation Data Services (NEDS) contract to provide a wide array of data management and scientific support services across various programmatic and evaluation activities. Essentially, NEDS is a pioneering effort for CSAT in that the Center previously had no mechanisms established to pull together databases for broad analytic purposes or to house databases produced under a wide array of activities. One of the specific objectives of the NEDS project is to provide CSAT with a flexible analytic capability to use existing data to address policy-relevant questions about substance abuse treatment. This report has been produced in pursuit of this objective.

This report explores the potential uses of four large-scale follow-up studies: the California Drug and Alcohol Treatment Assessment (CALDATA); the Services Research Outcomes Study (SROS); the National Treatment Improvement Evaluation Survey (NTIES); and the Drug Abuse Treatment Outcome Study (DATOS). It discusses similarities and differences in study designs and methods, compares some program and patient characteristics, and systematically reviews the outcomes of treatment as revealed by each of the studies, concluding with implications and recommendations for further research with the four studies.

Sharon Bishop
Project Director
National Evaluation Data Services

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ABSTRACT

This report compares the research methods, provider and patient characteristics, and outcome results from four large-scale follow-up studies of drug treatment during the 1990s: the California Drug and Alcohol Treatment Assessment (CALDATA), Services Research Outcomes Study (SROS), National Treatment Improvement Evaluation Study (NTIES), and Drug Abuse Treatment Outcomes Study (DATOS).

Methods and Characteristics. The first two studies were, respectively, state and national level stratified random probability samples of providers and patients using retrospective, one-contact designs. NTIES and DATOS were prospective, repeated-interview designs focusing on evaluations of urban provider networks with high percentages of minority group clients. Three of the studies covered approximately 1-year before-treatment and after-treatment reference periods, and SROS covered 5-year reference periods. All studies achieved multistage response rates of about 60 percent, except DATOS, which achieved about 40 percent.

Outcomes. From before treatment to after treatment, each study revealed across-the-board positive changes in drug use, crime, and health status. Clients in short-term and long-term residential treatment experienced positive changes in drug use, crime, employment, and health more often than clients in outpatient treatment. Clients discharged from (rather than maintained on) methadone displayed positive changes less often than any other group in treatment. Clients in SROS showed consistently fewer changes than the others on comparable variables, which may be due to its longer reference periods and lower precision of these comparable variables to measure long-term patterns of change.

Implications for treatment research, policy, and practice. Researchers should explore further the potential of these large data sets to capture differences in client populations, organization of services, and clinical practices that may explain differential outcomes and costs.

I. INTRODUCTION

Research advances on fundamental policy-relevant aspects of substance abuse treatment have arisen from a mixture of small experimental studies and large observational studies. Before the 1990s, large studies—which may be operationally defined as follow-ups of more than 1,000 treated individuals under one protocol—were rare, occurring at roughly once-every-10-years intervals (Simpson, 1974a, 1974b; Hubbard et al. 1989; Simpson and Curry, 1997). Nevertheless, these large studies shared enough in the way of common design features to generate important comparisons across time as well as answer new questions about treatment outcomes and their correlates.

However, in the 1990s, not just one but four large-scale observational studies were performed: the California Drug and Alcohol Treatment Assessment, Services Research Outcomes Study, National Treatment Improvement Evaluation Study, and Drug Abuse Treatment Outcomes Study (best known by their acronyms: CALDATA, SROS, NTIES, and DATOS). These four studies were close enough in time and in design features to open the possibility of bringing the study results together in new ways. In this paper, we take some exploratory steps in this direction. In particular, we compare the major features and results of the four studies with each other for the first time, appraising thereby the feasibility of using these data to as an unprecedented observational laboratory, a 300-program/10,000-person source of substance abuse treatment follow-up data.

This paper is based largely on published data, although some additional analysis was done on several unpublished variables to improve the comparisons. First, in a methodological comparison, we review the construction of the four study samples, including details about sampling, field procedures, and response rates. Next, we review characteristics of the programs selected and the demographic composition of the study samples. We compare the client outcome results of the four studies in terms of changes observed between intake and follow-up across a series of domains, including drug use, criminal activity, source of income, and physical and mental health. Finally, we develop some tentative implications of these methodological comparisons and outcome results for treatment research, policy, and practice.

II. METHODOLOGICAL COMPARISON

From 1990 to 1997, four large-scale observational follow-up studies were begun and completed (through a first round of post-treatment follow-up interviews) to evaluate substance abuse treatment outcomes. The four studies were:

- CALDATA—California Drug and Alcohol Treatment Assessment (Gerstein et al., 1994): a panel of 3,055 clients selected from client records abstracted in 87 clinical units, followed an average of 15 months after discharge from treatment in 1991-92; gross follow-up completion rate of 61 percent, multi-stage response rate of 58 percent.

- SROS—Services Research Outcomes Study (Schildhaus et al., 1998): a panel of 3,047 clients selected from client records abstracted in 99 units, followed up an average of 5 years after discharge from treatment in 1989-90; follow-up completion rate of 59 percent, multi-stage response rate of 55 percent.

- NTIES—National Treatment Improvement Evaluation Study (Gerstein et al., 1997): a panel of 6,593 clients completing intake interviews in 71 units, followed an average of nearly 1 year after discharge from treatment in 1993-94; follow-up completion rate of 82 percent, multi-stage response rate of 65 percent.

- DATOS—Drug Abuse Treatment Outcome Study, first-year follow-up (Simpson and Curry, 1997): a panel of 4,786 clients completing intake interviews in 76 units, followed up an average of 1 year after discharge from treatment in 1991-93; follow-up completion rate of 62 percent, multi-stage response rate response rate of 39 percent.

Exhibit II-1 presents summary information on the study sponsors and performers, sampling methods, sizes, and follow-up rate calculations for each study. While the study designs are similar in many ways, such as how the follow-up questionnaires were designed and analyzed, the studies also differed in important respects.

1. CALDATA

The sample design of CALDATA, a study designed and performed for the State of California by the National Opinion Research Center (NORC) in collaboration with Lewin-VHI, was in some respects the most straightforward. The population sampled were clients who were discharged between October 1991 and September 1992 from treatment providers who received any public funding (through contracts with county substance abuse treatment agencies, the state Medicaid office [MediCal], or other public agencies) in California during that period. This

EXHIBIT II-1
FOUR FOLLOW-UP STUDIES OF SUBSTANCE ABUSE TREATMENT SDUS IN THE UNITED STATES IN THE 1990S

	CALDATA	SROS	NTIES	DATOS
Sponsor	State of California/ADP	SAMHSA/OAS	SAMHSA/CSAT	NIDA
Survey Performer	NORC	NORC [Westat developed facility sample of 120/146]	NORC and RTI	RTI
Universe	Discharges from publicly funded California SDUs October 1991-Sept. 1992	Discharges from a U.S. drug treatment facility September 1989-August 1990	Admissions to SDUs in CSAT demonstration projects July 1993-September 1994	Admissions to "typical and stable" SDUs in 11 cities, November 1991-October 1993
Facility Sample	Probability sample stratified by modality and county	Probability sample stratified by modality and region	Purposive sample by modality, grant type, geography (16 cities)	Purposive sample, partial replicate of TOPS sites (11 cities)
Follow-Up Field Period	April-December 1993	June 95-March 96	August 93-October 95	1994-1996
Average Follow-Up (range)	15 months (9-24)	5 years (58-74 months)	11 months (5-20)	1 year
When Interviewed	At follow-up (before/ during/after segments)	At follow-up (before/after segments)	At intake, discharge, & follow-up	At intake, in-treatment, & follow-up
Modalities of Treatment (N.B.: NTIES included a correctional modality, omitted here)	California Social Model Other residential Methadone detox & maint. Outpatient nonmethadone	Hospital inpatient Residential Methadone Outpatient drug-free	Short-term residential Long-term resid. (>2 mo) Outpatient methadone Outpatient nonmethadone	Short-term inpatient Long-term resid. (>6 mo) Outpatient methadone Outpatient drug-free
SDUs Participating in/ Selected for Follow-Up	87/106 (82%)	99/120/146 (83%x82%=68%)	71/82 (87%)	76/120 (63%)
Follow-Up Interviews Completed/Follow-Up Panel[1]	1,858/3,055 (61%)	1,799/ 3,047 (59%)	5,388/6,593 (82%)	2,966/4,786 (62%)
All-Client & Multi-Stage [All-Client*SDU] Response Rates[2]	64% [58%]	65% [55%]	70% [65%]	48% [39%]

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EXHIBIT II-1 (CONTINUED)

FOUR FOLLOW-UP STUDIES OF SUBSTANCE ABUSE TREATMENT SDUS IN THE UNITED STATES IN THE 1990S

1. The client panel completion rate is completed follow-up interviews of clients who were enrolled successfully in the study panel in cooperating service delivery units (SDUs), that is, among clients who completed an intake interview (two intake interviews in the case of DATOS, which also subsampled to select the group to participate in the follow-up study, see Flynn et al. in Simpson and Curry, 1997). These rates do not take into account eligible/recruited but non-enrolled clients e.g., through failure or refusal to complete intake interviews) or any clients in noncooperating sample SDUs. Also, the response rates do not take into account possible undercoverage in SDU records of eligible clients.

2. The denominator for the All-Client calculation is all clients who received treatment in cooperating SDUs during the period of study induction, less those excluded due to strictly random subsampling and those known to be deceased or fully incapacitated by the time of the follow-up period. For CALDATA and SROS, this denominator is the same as the selected panel less those deceased of fully incapacitated. For NTIES, the denominator is the aggregate of all intake-eligible patients—those receiving one or more units of treatment—recorded in cooperating SDUs, for whom an 85 percent research induction rate (research intake interviews completed per all eligible) was achieved; less the deceased and incapacitated. The DATOS response rate is an estimate. Admissions records were not centrally collated as in NTIES, so the induction rate for the initial intake interview cannot be precisely determined with available data. We have estimated this induction rate at 90 percent; it may have been somewhat higher but could also have been lower (if comparable to NTIES, 85%). Finally, panel members were only followed up if they also completed a second intake interview; this appears to be approximately 84 percent of those who completed the first interview. Therefore, the estimated DATOS response rate, excluding also those deceased, is approximately (63%)(90%)(84%)=48 percent.

The All-Client*SDU calculation is the product of the All-Client response rate and the SDU response rate, adjusted to take into account estimated differences in SDU size between participating and nonparticipating SDUs. Nonparticipating SDUs were estimated to have approximately 50 percent fewer mean admissions, relative to the cooperating SDUs, which is consistent with the fragmentary available data.

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population included a high percentage (more than 90%) of all licensed drug and alcohol treatment providers located in California. The approach was "cold follow-up," that is, the clients were selected entirely from records obtained from treatment programs regarding specific treatment episodes. Based on information in the files (released for research purposes only, as permitted by state and Federal law), clients would then be sought, located, and recruited for interviewing about this past treatment episode and the periods before and after it.

In the first stage of sampling, information contained in the California Alcohol and Drug Data System (CADDS) was used to select a probability sample of clinical service delivery units (SDUs), selected within strata of geographic region, county, and modality of treatment. The regions represented the different parts of California: Los Angeles County, with one-fourth of the state population; the other populous urban counties of Southern California; the San Francisco Bay area; the Central Valley; and the remaining sparsely populated mountain, desert, and coastal counties. Within these strata, 16 counties (of 58) were selected using systematic random sampling (the largest counties were selected with certainty, the others with probabilities proportional to size). From the aggregate of SDUs in these counties, 110 SDUs were picked, with probability proportionate to size, representing five types of treatment: methadone detoxification, methadone maintenance (separate licenses, although many units held both types), nonmethadone outpatient, residential units identified as employing the "California social model" of services; and other residential units, virtually all of which employed a long-term therapeutic community approach.

Only 106 of these units, sampled from records, proved to have actually treated patients in the 1-year reference period, and these 106 were part of 97 treatment provider organizations. The provider organizations with more than one selected SDU turned out mostly to offer both methadone detoxification and methadone maintenance in the same clinic with the same staff. Moreover, about half of these dual-SDU units were linked together with other sampled units owned by a handful of proprietary "chains."

In the second stage of sampling, 87 SDUs (82 cooperating providers) permitted CALDATA staff to randomly select eligible clients for follow-up from their clinical records. CADDS made it possible to estimate the numbers of eligible clients in noncooperating as well as in cooperating sample providers, while data collected during the record abstraction phase made it possible to later compare respondents with nonrespondents within cooperating sample providers, a comparison that indicated great similarity between the interviewed (responding) and noninterviewed groups.

CALDATA staff randomly selected and abstracted 3,055 records from the 87 cooperating SDUs, with sampling procedures to generate approximately equal numbers (about 30 cases) from each unit, except that in units with fewer admissions than this, all admissions were selected, and in the very largest units, double or in some cases triple samples were drawn to reduce weighting variability. All clients who were discharged from treatment between October 1991 and September 1992, including those who were admitted but received no treatment services, were eligible for participation in the study. The sample was further supplemented to include clients who were in methadone maintenance during the eligibility period and were still in the same episode of treatment at the time that records were abstracted in early 1993. The 9-month interviewing field period began in April 1993 and ended in December 1993.

At the conclusion of the field period, 1,858 sample clients had been interviewed; however, due to project deadlines, only 1,826 cases could be included in the published analyses and data files.[1] The postdischarge follow-up durations at the time of interview ranged from 9 to 24 months with a median of 15 months. CALDATA therefore completed interviews with 61 percent of all sampled cases (64% excluding the deceased), and the multi-stage response rate is estimated to be 58 percent (see Exhibit II-1 footnote).

2. SROS

Like CALDATA, SROS was a cold follow-up study that used probability sampling at each stage of sample selection. Just as CALDATA was the first full probability sample of substance abuse treatment clients followed up at a state level, SROS was the first national level follow-up study to employ probability sampling of providers and clients. However, the SROS sample of cooperating providers, comprising 99 treatment facilities that were in operation between September 1989 and August 1990, did not represent the general population of treatment providers and clients in the U.S. as comprehensively as the CALDATA sample represented California. The main reason is that SROS, carried out by NORC for the Substance Abuse and Mental Health Services Administration and fielded during a 9-month span of client interviewing in 1995-1996, was based on a sample of treatment facilities that had participated in the Drug Services Research Study (DSRS) in 1991, a study performed for the National Institute on Drug Abuse by Westat, Inc., in collaboration with Brandeis University. The sampling rules that had

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[1] The four studies did not vary in one key respect: all provided the same monetary incentive of $15 for completing a follow-up interview. Three of the four studies also collected urine samples at the time of follow-up ($10 incentive), but at different sampling rates: SROS in three-fourths of all cases, NTIES in one-half, DATOS in one-quarter of cases, and CALDATA in no cases.

been used to select DSRS facilities from the 1990 NDATUS census of providers excluded outright just over half (50.4%) of the listed providers in NDATUS, namely all those classified as providing treatment for "alcohol only" rather than "drug only" or "combined drug and alcohol," and all those providers who were missing data on this (or on other) key design variables. Moreover, of the 146 facilities originally selected for DSRS, 26 facilities did not participate in DSRS and thus were ineligible for SROS, and another 21 providers who participated in DSRS did not participate in SROS, in many cases having gone out of business in the interim and leaving no custodial deposition of treatment records.

Like the CALDATA provider sample, the SROS sample was stratified by region of the country and included outpatient methadone providers (both detoxification and maintenance), outpatient nonmethadone providers, longer term residential treatment providers, (most of them therapeutic communities), and shorter term residential treatment providers. Unlike CALDATA, these shorter term providers across the U.S. were largely hospital inpatient programs, that is, "medical model" in staffing and orientation rather than "social model." The DSRS sample had been selected without regard to size of SDU, so the numbers of clients selected in the larger SDUs were adjusted to reflect SDU size.

Clients in SROS, as in CALDATA, were followed on a cold basis, that is, strictly from records-generated information, 5 to 6 years after leaving treatment, compared with an average of 15 months after treatment in CALDATA. The SROS identifying and locating information was again restricted to the information contained in abstracted clinical treatment records, and the SROS client follow-up rate of 59 percent, translating to 65 percent of living sample cases, is remarkably similar to that of CALDATA, as is the estimated multi-stage response rate of 55 percent. However, the cost per case in SROS was substantially higher than CALDATA, requiring about half again as many field interviewer hours per completed interview.

Aside from the difference in resources expended, the similar results probably reflect the less urbanized character of the SROS sample and the tendency of more poorly organized programs (those with the least informative records) to be omitted from the initial sampling frame or to become lost to the sample during the intervening years. In addition, the much longer lead time of the SROS project, a result of slower stage-by-stage approval processes, permitted various locating efforts such as electronic search for database matches to proceed in advance of rather than relatively late in the respective 9-month field periods. Finally, since SROS client data collection was performed by the same survey organization as performed CALDATA, the

experience previously gained with this cold follow-up methodology probably benefitted the second study.

3. NTIES

The sample of substance abuse treatment programs included in NTIES was drawn on a purposive rather than probability basis from a special cohort of SDUs. The 800 or so eligible SDUs were affiliated with one or more of 157 successful 1990-91 applicants to the Center for Substance Abuse Treatment (CSAT) for demonstration grants to enhance or expand treatment services for selected population groups, including individuals residing in nine of the largest urban centers ("target cities"), public housing residents, racial/ethnic minorities, pregnant and postpartum women, and adolescent and adult criminal justice populations. CSAT contracted with NORC and its subcontracting partner, Research Triangle Institute (RTI), to design and carry out NTIES. The NTIES staff selected a set of SDUs that would assure coverage of each of the major demonstration program areas, provide economical geographic clustering of the field cases, and select SDU sizes in favor of larger ones to control research costs and minimize potentials for SDU attrition across the multi-year field period due to financial distress.

Unlike CALDATA and SROS, research subjects in NTIES were recruited to the study at the time of intake to treatment, so that follow-up was based on collecting research-oriented locator information as well on program records. Within the 71 productive sample SDUs in 16 states, all clients who met two requirements were eligible for follow-up: 1) any receipt of treatment services, operationalized as either staying a minimum of one night if a residential program or completing one outpatient treatment visit beyond the intake procedure, if an outpatient program; and 2) completing a 75-minute research intake interview that included the detailed locating information to be used for follow-up within 21 days after being admitted to treatment between August 1993 and October 1994. Except in the largest SDUs, where the roster of clients was randomly subsampled to cap the maximum number per SDU at about 200 cases, all clients beginning treatment in each sample SDU during the 15-month "admission window" were recruited for an NTIES intake interview, on average about 110 per SDU.

Of those eligible for NTIES, 85 percent completed the intake interview, with most of the loss reflecting failure to successfully schedule the intake interview within 21 days of admission rather than to an outright refusal. All of the 6,593 clients who completed the intake interview were targeted for follow-up interviews approximately 12 months after leaving treatment. In the interim, all 6,593 clients were also eligible for a 'treatment experience" interview at the time of

discharge or after being in treatment for an extended period, and 80 percent of the NTIES panel completed the interim interview.[2]

The 12-month follow-up response rate was 82 percent (slightly higher, but rounding to the same number, when the small number of deceased and other excluded cases are removed from the denominator), about 20 points higher than the follow-up interview completion rates obtained in CALDATA and SROS. NTIES required about one-third less follow-up interviewer time per completed follow-up interview than CALDATA and nearly two-thirds less than SROS. However, the difference in interviewer time between CALDATA and NTIES disappeared when one took into account the time required to complete the NTIES intake as well as follow-up interviews. NTIES staff pursued in-person follow-up if the respondent resided within a 150-mile travel radius. Also, like CALDATA, NTIES permitted telephone interviewing where personal interviews could not be obtained, and telephone interviews accounted for 2 percent of NTIES follow-up cases.

The response rate advantage of NTIES over SROS and CALDATA was due largely to the prospective enrollment of the sample at the time of admission, so that the follow-up rate is based only on cases for whom research-quality locator data have been collected, and on cases that have already complied to some extent with the research protocol. The higher follow-up rate may also have been partially due to the characteristics of programs included in the specialized target population; in particular, correctional programs achieved response rates exceeding 90 percent. However, the targeting of CSAT grants toward "needier" programs having less secure relationships with their funding agencies and clients, and the concentration of sample SDUs in inner city areas, which are a recurrent challenge for fieldwork, would not favor higher follow-up rates. Moreover, if one bases the NTIES follow-up rate not on those completing the intake interview but on all those eligible for the intake interview, the follow-up rate becomes 70 percent of the eligible nondeceased sample, which is much closer to the SROS and CALDATA results; and the estimated multi-stage response rate is 65 percent.[3]

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[2] The principal reason for noninterview was, again, missing the window of eligibility, which was within 8 weeks of discharge. In outpatient programs in particular, information about discharge was often not obtained or confirmed soon enough to locate and recruit the client before this window expired.

[3] The NTIES field period for follow-up interviews was approximately 12 months; however, cases were released to follow-up at different points, with some made available at 10 months after treatment with eligibility nominally ending at 14 months; others as early as 5 months after treatment due to the need to conclude the study. The median interview took place 11 months after discharge, and more than 90 percent were completed between 6 and 15 months after treatment.

A final element in the NTIES follow-up experience was an evident "house effect." The NTIES SDUs were divided among two sets of field assignments. One set of research SDUs was staffed and supervised by one of the two NTIES survey houses (RTI), the second set was staffed by the other house (NORC). The follow-up interview completion rate in the first set of SDUs was 70 percent, as compared to 85 percent in the second set. Regional patterns of field assignment would not account for this difference, since the NORC assignment included Eastern inner cities; both assignments included some Southern and Southwestern cities; and the RTI assignments covered mostly smaller urban areas and towns in the West.

NTIES drew from short-term residential/hospital, long-term residential (with treatment plans greater than 2 months and nearly all calling themselves therapeutic communities), and methadone and nonmethadone outpatient SDUs. Relative to the other studies, NTIES had fewer methadone maintenance programs, drawing only about 8 percent of its client panel from such programs, as compared with more than 20 percent in each of the other studies (see Exhibit II-2); however, the other studies included far more programs in order to fill out their methadone strata than the quantitative share this modality of treatment actually occupies in the national picture (about 12-13%; see Gerstein et al., 1997 and SAMHSA, 1997). NTIES was also the only study that included correctional facilities, drawing about one-fourth of its client sample from such facilities.

4. DATOS

Like NTIES, DATOS featured a purposive sample of drug and alcohol treatment programs in which the follow-up research cohort was recruited on a prospective basis. In DATOS, 11 cities were initially chosen as sites for the study, many of them the same cities (and some of the same programs) as had been studied a decade earlier in the large-scale TOPS cohort (Hubbard et al., 1989). DATOS, like the Treatment Outcome Prospective Study (TOPS), was sponsored by the National Institute on Drug Abuse and performed by RTI.[4] Within each DATOS city, an attempt was made to recruit "typical and stable" programs from each of four modalities, including short-term and long-term residential (similar to the SROS and NTIES definitions), outpatient methadone, and outpatient drug-free (nonmethadone).

[4] However, whereas the TOPS data collection was carried out by RTI with NORC as a subcontractor, the DATOS fieldwork was performed entirely by RTI. Beginning in 1996, the analytic phase and a 5-year DATOS follow-up wave were taken over by a different set of research organizations under the Cooperative DATOS (C-DATOS) agreement; see Simpson and Curry, 1997).

EXHIBIT II-2
PROVIDER CHARACTERISTICS: PUBLIC REVENUE SOURCES, PATIENTS SETTING TREATMENT GOALS, AND CHANGES IN OWNERSHIP OR ADMINISTRATIVE OVERSIGHT

	CALDATA	SROS	NTIES	DATOS
Percentage of Revenues from Public Sources		**"Public agencies" incl. "public insurance"**		**"Medicaid, Medicare, block grants, other Federal; Alcohol/drug agency, corrections, other state; county, city, other local"**
Short-Term Residential	-	49	-	42
Long-Term Residential	-	86	-	86
Outpatient Methadone	-	75	-	90
Outpatient NonMethadone	-	68	-	79
Percentage whose patients set own treatment goals...to a great extent				
Short-Term Residential	77	67	33	-
Long-Term Residential	53	78	51	-
Outpatient Methadone	82	74	53	-
Outpatient NonMethadone	43	54	56	-
Any change in ownership or administrative oversight	**Since January 1, 1991 (21 months, 1991-1992)**	**Since January 1, 1990 (5 years, 1990-1994)**	**Since June 1, 1992 (12 months, 1992-1993)**	
Short-Term Residential	22	45	18	-
Long-Term Residential	29	26	26	-
Outpatient Methadone	23	33	21	-
Outpatient NonMethadone	29	19	13	-

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Relative to the other three studies, an important distinguishing characteristic of DATOS is that the eligibility criteria for follow-up of clients within cooperating programs were stringent and complex. The follow-up sample was limited to clients who completed two 90-minute intake interviews and were from one of the 76 programs in which 20 or more clients had completed both of two 90-minute DATOS intake interviews. In addition, the subsample selected for follow-up (4,786 clients) was selected so as to oversample longer lengths of stay in treatment.

As in NTIES, some characteristics of the DATOS sample may have facilitated the locating of sample cases and therefore favored a higher follow-up response rate. These characteristics included the restriction of the follow-up to organizationally stable providers; intermediate research interviews for those remaining in treatment, scheduled at 1, 3, 6, and 12 months in treatment. DATOS also undersampled clients with shorter lengths of stay, whose compliance can be more difficult to obtain.[5] As with NTIES, not all individuals admitted to treatment in the participating SDUs entered the research sample. Specific information is not available for DATOS (as it was for NTIES) on what percentage of the eligible patients completed the first intake interviews. Interviews were conducted only in-person and within the 11 cities, even when sample clients had moved to other cities or nonmetropolitan areas.

The purposive nature of the first-stage sample and the selective noncooperation and ineligibility of sample programs reduce the generalizability or external validity of DATOS information. Simpson and Curry (1997) report that 120 cooperating treatment programs were originally selected within the 11 cities. (The number of programs selected but refusing to cooperate is not reported.) Twenty-four of these 120 programs were dropped from DATOS early on due to low initial client flow, while 20 more were excluded from the follow-up protocol because they yielded fewer than 20 clients who completed both intake interviews.

The DATOS 12-month follow-up response rate was 62 percent, quite similar to the response rates for the cold follow-up in SROS and CALDATA percent, but about 20 percentage points lower than the comparable NTIES statistic. This rate falls to 48 percent of the total nondeceased/nonincapacitated client denominator, compared to 70 percent in NTIES, and due to the dropping of so many smaller SDUs, the estimated multi-stage response rate falls to 39 percent. The DATOS protocol was less aggressive than NTIES in seeking follow-up interviews;

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[5] Using the criterion of remaining in treatment for 3 months or longer (very much appropriate to three of the four DATOS treatment types, less so for the short-term inpatient modality), this difference is visible in response rates among those selected for follow-up. In the long-term residential modality, 62 percent of respondents versus 50 percent of nonrespondents surpassed this length of stay; in the outpatient drug-free mode, 58 versus 48 percent; in methadone, 92 percent versus 78 percent.

nevertheless, DATOS required approximately 25 percent more interviewer hours per completed follow-up interview than NTIES.

5. CONCLUSION

There were large variations in follow-up completion rate and multi-stage response rate among the four treatment studies. These variations were due partly to variations in basic research design and partly to a difference in aggressiveness or effectiveness in carrying out follow-up fieldwork. The single interview "cold" follow-up design, operating on a purely retrospective basis, is attractive because it can be completed much more rapidly than the prospective/retrospective, two-interview design. The trade-off for more rapid study completion is probably some loss in precision due to recall factors, a reduction in total information due to the reduced total interview time, and a loss of about 20 percentage points in response rate relative to a pre-enrolled panel; but only about 5 points loss over the total client sample at intake. Considering the time required for the pre-enrollment interview, and considering that the on-site effort required to generate a records-only sample is approximately equal to the cost of completing a post-discharge client record abstraction (required in the NTIES and DATOS protocols), there is not a substantial difference between the two design types in terms of field hours (and associated cost) for comparable sample sizes for similar post-discharge periods.

Two of the studies were based on probability samples of well-defined and geographically comprehensive general treatment populations. Even though probability sampling of general treatment populations poses challenges for gaining cooperation from an adequate proportion of sampled SDUs and for successful follow-up of former treatment clients, this kind of sampling has many attractive features. Probability sampling supports inferences to a population that endures in time and remains politically as well as scientifically meaningful—e.g., the population of individuals admitted to drug and alcohol treatment in a specified geographic domain during specified periods. Probability samples in successive studies provide the firmest foundation for generalized conclusions about changes in treatment effectiveness, since they minimize the risk present in purposive samples that differences in the research results are artifacts of the different SDUs that happened to be studied.[6]

[6] DATOS did return to largely the same cities—in many instances the same programs—that had been studied 10 years earlier in TOPS (Hubbard et al., 1989), allowing some valuable temporal comparisons of treatment components and effectiveness.

In the absence of a common target population, it is somewhat hazardous to compare response rates among studies. Since the response patterns of each survey may reflect the unique population that was represented, it is not surprising that some generalizations about differences between respondents and nonrespondents are not supported by more than one survey. For example, CALDATA and SROS reported higher response rates among Hispanics than nonHispanics, while DATOS reported the opposite and NTIES, with its higher overall responses rates, found no differences. CALDATA, SROS, and DATOS report consistently higher follow-up rates among women than among men, whereas in NTIES (again, with higher overall response) the difference by gender was quite small. In view of the differences in sampling methodology and coverage, it may be expected that there would be differences in provider and patient characteristics and in outcomes achieved. The next sections of the paper are devoted to exploring these expectations.

III. PUBLISHED DATA ON PROVIDER AND PATIENT CHARACTERISTICS

Each of the four treatment studies had a provider survey component, allowing in principle for comparisons of various types of treatment modalities. These sections were completed by directors and other personnel of the selected treatment facilities. The surveys contain items that reflect similar elements—sources of revenue, treatment goals and emphases, ownership charactaeristics, as well as staffing patterns, caseloads, and services provided. However, the published results of the four studies emphasized different aspects of providers; so much so that only one published measure was comparable across as many as three of the studies. We have calculated some additional measures here to permit some additional comparisons across three of the studies, but this discussion only reflects the beginning stages of working through the provider data in search of comprehensive comparisons.

1. SOURCES OF REVENUE

Reports on SROS and DATOS included measures of the providers' sources of revenue, specifically, the percentage of total revenue that was public revenue. To be classified as public revenue, it was necessary for part of reported finances to have originated from Federal, state, or local government agencies rather than from private insurance or other sources. Exhibit II-2 presents the published findings on this measure for SROS and DATOS. The percentage of total revenue from public sources was fairly consistent for each treatment type. About three-quarters of the revenues of SDUs were public. This appears to be lower in the methadone and outpatient SDUs in the nationally representative SROS data than in DATOS.

2. CLIENT INVOLVEMENT IN TREATMENT GOALS

Three of the four studies reported on items in their questionnaires that represented whether treatment participants helped "to a great extent" to establish their own treatment goals. These data are presented in Exhibit II-2 and may be summarized as follows:

- Providers of short-term residential treatment in NTIES (33%) reported a much lower percentage of clients participating in setting their own treatment goals than such providers reported in CALDATA (77%) and SROS (67%)

- NTIES methadone providers reported less extensive client goal-setting (53%) than providers in CALDATA (82%) and SROS (74%) reported

- The percentage of clients in long-term residential facilities reported by administrators to have helped set their own treatment goals appeared to be higher in SROS (78%) than in CALDATA (53%) or NTIES (51%)

- For outpatient non-methadone facilities, the percentage of clients reported to set their own treatment goals is more comparable than among the three studies: CALDATA at 43 percent, SROS at 54 percent, and NTIES at 56 percent.

3. STABILITY OF OWNERSHIP OR ADMINISTRATION

Measures of stability included in CALDATA, SROS, and NTIES asked whether the treatment unit had undergone any change in ownership or administrative oversight for a defined period of time: CALDATA covers nearly 2 years, SROS 5 years, and NTIES 1 year. Exhibit II-2 lists the results.

- About half (45%) of short-term residential providers and one-third (33%) of outpatient methadone providers in SROS reported change in ownership or administrative oversight between 1990-1994. The comparable percentages were 22 percent and 23 percent for CALDATA and 18 percent and 21 percent for NTIES, consonant with the shorter exposure periods in these studies.

- Despite the differing exposure periods, the percentage of turnover reported by long-term residential providers was quite consistent across the three studies, ranging from 26 percent to 29 percent.

- The outpatient nonmethadone results also seem contrary to the exposure periods: the turnover was lowest in NTIES (13%), somewhat higher in SROS (19%), and highest in the CALDATA units (29%).

4. DEMOGRAPHICS OF CLIENTS

Exhibit III-1 presents an overview of the demographic composition of the client samples of each of the four studies. Most of the modality-by-modality comparisons yield rates of gender and age distribution within about 15 percentage points of one another. However, a few differences exceeded this, and one characteristic in particular, racial/ethnic distribution, was systematically different across the samples. NTIES and DATOS, drawing heavily from medium to large metropolitan areas, had consistently higher percentages of respondents who are black or Hispanic than do SROS and CALDATA. Generally, the "minority" groups were about two-thirds of participants in NTIES and DATOS and about 40 percent in CALDATA and SROS.

EXHIBIT III-1
DEMOGRAPHIC VARIABLES BY STUDY AND TREATMENT MODALITY

	Short-Term Residential					Long-Term Residential					Methadone						Outpatient Nonmethadone			
	CALDATA**	SROS	NTIES	DATOS		CALDATA	SROS	NTIES	DATOS		CALDATA Detx./Disch	CALDATA Contin. MM	SROS	NTIES	DATOS		CALDATA	SROS	NTIES	DATOS
% Female	29	28	32	33		35	22	50	35		36	43	45	32	40		42	30	28	34
% Age 30+	69	58	55	64		63	46	49	50		80	91	72	83	82		57	48	59	59
% Race/Ethnicity																				
Hispanic	9	5	13			13	3	11			46	38	12	25			33	13	15	
Black non-Hispanic	32	35	56			34	33	62			8	5	39	47			11	18	62	
White non-Hispanic	54	56	31			45	60	27			40	51	47	28			50	66	23	
Other	7	3	(white +other)			7	4				6	6	2				7	4		
% Black or Hispanic	*41*	*41*	*69*	61		*47*	*36*	*73*	60		*54*	*43*	*51*	*72*	51.6		*44*	*31*	*77*	66
% High School grad. or GED		72	63	72			75	49	59				70	56	67			70	54	60
% Married or living as married		32	25	38			27	16	22				24	29	40			35	19	27

* CALDATA separates respondents in continuing methadone maintenance from those in methadone detoxification or discharged from maintenance programs.

** In CALDATA these are Social Model programs. Sources: CALDATA: table 2, table 14; SROS: table 3-3; NTIES: table 2.8; DATOS: table 1.

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In addition, across modalities, NTIES consistently had lower percentages of respondents with a high school degree than either SROS and lower percentages of respondents who were married. NTIES focused on programs that had received CSAT grants and were either in the nation's largest cities, working with "critical populations" including people in public housing, or working with criminal justice populations.

5. CONCLUSIONS

The differences in the ownership/administrative turnover, client goal-setting, and client demographics suggest that the provider and client populations selected in the four studies may be distinctive in important domains. The very limited degree of overlap in the published provider data precludes extensive interpretation of the differences, but the results do suggest the importance of carrying out a more comprehensive assessment that would go well beyond the published materials. The long-term residential providers in NTIES and CALDATA and the outpatient nonmethadone units in CALDATA seemed to turn over more rapidly than expected relative to the SROS sample. The meaning of these differences awaits further analysis of the provider information.

IV. DRUG USE OUTCOMES

Over the years that drug treatment outcome studies have been conducted, a variety of approaches have been taken to describe drug use. Until the 1970s, virtually all of the treatment programs under study focused on heroin addiction, and little attention was paid to other drugs. In the first major national survey, the Drug Abuse Reporting Program (Sells, 1974a, 1974b), elaborate efforts were made to classify drug users according to the combinations of drugs used. These classification efforts continued but grew less complicated (incorporating fewer, broader types), in the Treatment Outcome Prospective Study (Hubbard et al., 1989). In the studies of the 1990s, drug use had been treated two ways. First, the most commonly used drugs—heroin, cocaine, marijuana, alcohol, amphetamine—have been viewed separately, each one indexing a conceptually distinct change. Secondly, individuals have been asked to identify their "primary" drug or drug-combination, and analysis has focused on changes in use of the primary drug. In this paper, we focus on the individual drugs that the published results have treated in similar ways, with threshold measures of consumption during the reference periods before and after treatment. These drugs are marijuana, cocaine (powder and crack), and heroin.

Before reviewing the relevant data, it is useful to review once again the treatments being compared and the way they are handled in the analysis. The short-term residential units are, at first glance, the most diverse category. All short-term residential units in CALDATA are "California Social Model" programs; those in SROS and DATOS are "hospital inpatient" units; and NTIES enrolled a mixture of hospital-based wards, spiritually guided Salvation Army type programs, and social-model oriented programs. The long-term residential units in all studies are largely therapeutic communities. The methadone units are similar to one another in that all are FDA-licensed providers; however, the patients selected for follow-up and how they are grouped in the analyses differ. In DATOS, all methadone patients were merged together—those who were still in treatment at the time of follow-up and those who had been discharged. In SROS, all of the patients were discharged but some from detoxification and others from maintenance treatment plans. In NTIES, all patients had been enrolled in maintenance and none in detoxification plans; however, those who stayed continuously in treatment through the follow-up interview are analyzed separately from those who did not. Finally, in CALDATA, clients continuing in maintenance through the follow-up period are analyzed separately from those who were discharged, but the latter four include both those admitted to detoxification and those who were discharged from maintenance plans.

Within each study, the same population was included in both the before-treatment and after-treatment statistics. The population sizes analyzed and reported in the following pages vary

somewhat from those reported in Exhibit II-1. The DATOS and SROS populations are equal to the follow-up cohorts in Exhibit II-1, that is, 2,966 and 1,799 cases, respectively. The CALDATA population is slightly smaller than the follow-up cohort (1,826), because 32 of 1,858 cases were collected too late to be coded for inclusion in the analysis. The NTIES group reported on here comprises 3,702 out of 5,388 in the follow-up cohort. It is so much smaller mainly because we omit here the entire correctional treatment modality (there being no equivalent modality in the other three studies). We also omitted a small group of persons whose follow-up interviews were completed before or after the 5- to 16-month "window" of eligibility for follow-up.

1. MARIJUANA

The CALDATA, SROS, and NTIES reports were based on using marijuana five times or more during the reference period, while DATOS was based on using marijuana at least weekly.

As shown in Exhibit IV-1, in all modalities in all studies, marijuana use declined significantly (using a t-test to determine significant differences) in the reference period after treatment. In each study, the change measures in the two residential treatment modalities were quite similar. They were also very similar to each other across CALDATA, NTIES, and DATOS (-51% to -65%), and notably lower in SROS (-35% and -32%). Change in the outpatient methadone and nonmethadone units was more disparate, particularly in DATOS where the methadone clients reported relatively low levels of change (-19%) and the nonmethadone clients reported high levels of change (-67%). In NTIES the outpatient modalities were very similar (-42%), and in SROS and CALDATA they were not far apart (ranging from -19% to -34%).

We also developed statistics for marijuana in CALDATA using a measure that is similar to the reported measure in DATOS. The CALDATA measure is how often marijuana was used during the month when it was used most often, we specifically report here whether it was used more than 5 days per month; this is compared with DATOS 1 time a week or more during the past year. The results, as shown in Exhibit IV-2, are much more like DATOS in terms of the absolute levels of use before and after treatment and are somewhat closer as well in terms of relative change.

EXHIBIT IV-1
TREATMENT EFFECTS ON MARIJUANA USE BY STUDY AND TREATMENT MODALITY

	CALDATA			SROS			NTIES			DATOS		
	During (MONTHS) did you use marijuana five times or more?			Looking at the calendar, in the 5 years before [date] did you use marijuana 5 times or more?			Since (DATE) have you used marijuana, pot, or hashish five times or more?			Which number on this card indicates how often you used [DRUG] during the past year? [Weekly/1 time a week OR MORE]		
Time Frame:	1 year			5 years			1 year			1 year		
Treatment Effect	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ
Short-Term Residential	49.1	23.3	**-53**	54.8	36.0	**-35**	59.6	25.6	**-57**	30.3	10.5	**-65**
Long-Term Residential	56.4	27.8	**-51**	67.9	47.1	**-32**	60.2	29.4	**-51**	28.3	12.7	**-55**
Methadone Discharge	37.1	25.5	**-31**	58.5	39.3	**-33**	48.2	28.1	**-42**	17.1	13.9	**-19**
Methadone Maintenance	32.2	25.8	**-20**				44.4	25.8	**-42**			
Outpatient Non-Methadone	46.3	30.7	**-34**	52.8	43.2	**-19**	49.9	28.7	**-42**	25.4	8.5	**-67**

Notes: Differences are significant at $p<.05$ level, unless stated otherwise.

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EXHIBIT IV-2
TREATMENT EFFECTS ON MARIJUANA USE IN CALDATA AND DATOS

	CALDATA			DATOS		
	Used more than 5 days in the month of most frequent use during the reference period.			Which number on this card indicates how often you used [DRUG] during the past year? [Weekly/1 time a week OR MORE]		
Time Frame:	1 year			1 year		
Treatment Effect	PRE	POST	% Δ	PRE	POST	% Δ
Short-Term Residential	29.2	10.5	**-64**	30.3	10.5	**-65**
Long-Term Residential	39.1	14.4	**-63**	28.3	12.7	**-55**
Methadone Discharge	21.5	15.1	**-30**	17.1	13.9	**-19**
Methadone Maintenance	18.1	15.8	**-13**			
Outpatient Non-Methadone	32.7	17.0	**-48**	25.4	8.5	**-67**

Notes: Differences are significant at p<.05 level, unless stated otherwise.

2. COCAINE

DATOS combined powdered cocaine and crack use in its published analyses, while the other studies separated results for these forms of cocaine. Exhibit IV-3 reports the combined cocaine results for DATOS along with the powdered cocaine results for the other three studies. As with marijuana use, all modalities in all studies report significant declines in cocaine use. As with marijuana use, the residential modalities yielded results similar to each other in each study and quite similar across the four studies (-47% to -69%), with SROS reporting changes at the lower end of the range (-47% and -55%). The studies also reported very similar results in the outpatient modality (-51% to -56%), with SROS somewhat lower (-42%). There was a wider range in the methadone results, with NTIES, DATOS, and the CALDATA maintenance group similar (-45%, -48%, and -36%), SROS and CALDATA discharge group lower (both -20%).

EXHIBIT IV-3
TREATMENT EFFECTS ON COCAINE USE BY STUDY AND TREATMENT MODALITY

	CALDATA			SROS			NTIES			DATOS		
	During [months], did you use cocaine 5 times or more?			Looking at the calendar, in the 5 years before [date] did you use cocaine 5 times or more?			Since (DATE) have you used cocaine powder five times or more?			Which number on this card indicates how often you used [DRUG] during the past year? [Weekly/1 time a week OR MORE] (includes all forms of cocaine)		
Time Frame:	1 year			5 years			1 year			1 year		
Treatment Effect	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ
Short-Term Residential	*38.6*	*13.7*	**-64**	45.2	23.8	**-47**	46.3	21.8	**-53**	66.8	20.8	**-69**
Long-Term Residential	*37.2*	*11.8*	**-68**	53.4	24.3	**-55**	42.1	17.0	**-60**	66.4	22.1	**-67**
Outpatient, Methadone Detox.	*53.1*	*39.8*	**-20**	61.2	49.3	**-20**	60.1	46.3	**-23**	41.9	21.7	**-48**
Methadone Maintenance	*41.8*	*26.7*	**-36**				54.2	29.9	**-45**			
Outpatient, Non-Methadone	*29.0*	*14.1*	**-51**	33.9	19.5	**-42**	28.0	13.4	**-52**	41.7	18.3	**-56**

Notes: Differences are significant at $p<.05$ level, unless stated otherwise.

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Exhibit IV-4 reports for three studies the results for crack cocaine. All residential and outpatient results for NTIES and CALDATA were quite similar (-42% to -52%), but the SROS results were markedly lower (no significant change on outpatient, -14% and -32% in residential). There were also no significant changes in crack use in methadone users in NTIES or SROS, but these were significant in CALDATA (-28% and -42%). Crack use was at a much lower level of use before treatment in the all modalities than was cocaine or marijuana use.

3. HEROIN

As shown in Exhibit IV-5, pretreatment heroin use ranged from rather uncommon to moderately common (prevalence of 6% to 27%) in all modalities except methadone, where it was extremely common (82% to 98%). Changes in heroin use were significant in all modalities in three of the four studies; in SROS, only in the methadone modality was there significant change. Outside of methadone programs, the outpatient changes were lower than in residential treatment, and the CALDATA changes were lower (-26% to -36%) than those in NTIES and DATOS (-41% to -69%). Discharged methadone patients changed less (-13% to -27%) than those in continuing maintenance (-39% to -51%), and the most change was reported in DATOS (-69%). As with marijuana, we calculated for CALDATA a measure similar to the DATOS measure (was used at least 5 times/month in the "peak" month, compared with 1 time/week or more during the past year). As reported in Exhibit IV-6, these comparisons bring the outpatient and maintenance results in CALDATA and DATOS somewhat closer together.

EXHIBIT IV-4
TREATMENT EFFECTS ON CRACK USE BY STUDY AND TREATMENT MODALITY

	CALDATA			SROS			NTIES		
	During [months], did you use crack 5 times or more?			Looking at the calendar, in the 5 years before [date] did you use crack 5 times or more?			Since (DATE) have you used crack, not cocaine powder, five times or more?		
Time Frame:	1 year			5 years			1 year		
Treatment Effect	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ
Total	29.1	15.8	**-467**	29.0	24.3	**-17**	50.4	24.8	**-51**
Short-Term Residential	41.4	18.5	**-55**	36.5	31.2	**-14**	60.3	30.0	**-50**
Long-Term Residential	49.5	24.7	**-50**	48.5	33.8	**-32**	65.9	32.6	**-51**
Methadone Discharge	20.2	14.6	**-28**	24.2	23.7	**n.s.**	32.4	27.1	**n.s.**
Methadone Maintenance	9.7	5.6	**-42**				24.3	29.6	**n.s.**
Outpatient, Non-Methadone	20.0	11.7	**-42**	14.0	13.7	**n.s.**	45.6	22.0	**-52**

Notes: Differences are significant at p<.05 level, unless stated otherwise.

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EXHIBIT IV-5
TREATMENT EFFECTS ON HEROIN USE BY STUDY AND TREATMENT MODALITY

	CALDATA			SROS			NTIES			DATOS		
	During [months], did you use heroin 5 times or more?			Looking at the calendar, in the 5 years before [date] did you use heroin 5 times or more?			Since (DATE) have you used heroin five times or more?			Which number on this card indicates how often you used [DRUG] during the past year? [Weekly/1 time a week OR MORE]		
Time Frame:	1 year			5 years			1 year			1 year		
Treatment Effect	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ
Short-Term Residential	13.0	8.3	**-36.**	14.5	12.6	**n.s.**	26.8	10.2	**-62**	7.0	2.2	**-69**
Long-Term Residential	16.5	10.8	**-35**	9.2	9.0	**n.s.**	10.7	5.9	**-45**	17.2	5.8	**-66**
Methadone Discharge	95.4	82.9	**-13**	82.1	60.1	**-27**	98.2	73.5	**-25**	89.4	27.8	**-69**
Methadone Maintenance	85.4	52.6	**-39**				93.1	46.0	**-51**			
Outpatient, Non-Methadone	10.6	7.9	**-26**	6.7	6.7	**n.s.**	8.8	5.2	**-41**	5.9	3.3	**-44**

Notes: Differences are significant at $p<.05$ level, unless stated otherwise.

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EXHIBIT IV-6
TREATMENT EFFECTS ON HEROIN USE IN CALDATA AND DATOS

	CALDATA			DATOS		
	Used more than 5 days in the month of most frequent use during the reference period.			Which number on this card indicates how often you used [DRUG] during the past year? [Weekly/1 time a week OR MORE]		
Time Frame:	1 year			1 year		
Treatment Effect	PRE	POST	% Δ	PRE	POST	% Δ
Short-Term Residential	8.1	4.6	**-43**	7.0	2.2	**-69**
Long-Term Residential	12.1	8.0	**-34**	17.2	5.8	**-66**
Methadone Discharge	89.1	68.8	**-23**	89.4	27.8	**-69**
Methadone Maintenance	75.3	29.6	**-61**			
Outpatient Non-Methadone	7.8	4.5	**-42**	5.9	3.3	**-44**

Notes: Differences are significant at $p<.05$ level, unless stated otherwise.

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V. OTHER OUTCOMES

1. CRIMINAL ACTIVITY

The pre-treatment and follow-up instrumentation for all four studies contain measures of criminal behavior. These questions assess the following general types of criminal behavior:

- Criminal activity that may or may not have resulted in criminal justice involvement
- Criminal justice involvement, including arrests, convictions, incarcerations, etc.
- Income from illegal activities.

The published findings for each of the four studies assess changes in criminal behavior as a treatment outcome. In each case, there were significant reductions in various criminal behaviors following discharge from treatment as compared to pre-treatment behaviors.

- **CALDATA** Significant decline in the percentage of clients arrested and committing any illegal activity, as well as specific illegal activities, including drug sale/manufacturing, burglary, and assault
- **SROS** Significant reduction in the commission of several criminal activities, including vehicle theft, DUI/DWI, drug sale/manufacture, prostitution and procurement, fraud/forgery, theft/larceny, burglary, and assault
- **NTIES** Significant decline in the percentage of clients arrested, for both any charge and for drug possession; the percentage of clients committing specific criminal activities, including drug sale/manufacture, shoplifting, and assault; and the percentage of clients supported primarily with money obtained through illegal activities
- **DATOS** Significant reduction in arrests, incarcerations, criminal justice involvement, and the commission of predatory illegal activity (i.e., assault, robbery, burglary, larceny, forgery, or dealing in stolen property).

Exhibit V-1 summarizes the published findings from CALDATA, SROS, NTIES, and DATOS on the percentage of clients arrested, booked, or taken into custody during the periods before and

after treatment. The percentage of clients reporting arrests during the pre- and post-treatment reference periods in CALDATA, NTIES, and DATOS, overall and within each treatment modality, are similar. By contrast, the percentage of clients reporting arrests during these periods in the SROS study is substantially higher; most likely also as a result of the longer reference period. In CALDATA and NTIES, the reductions in arrests in the modalities outside of methadone were all in the range of -60 percent to -68 percent. By contrast, the declines in DATOS were appreciably smaller (-31% and -40%), and the declines in SROS were smaller yet (-9% to -28%). Among methadone clients, the maintenance groups in CALDATA and NTIES reported the largest reductions in arrests (-82% and -55%), with lesser reductions in the CALDATA and NTIES discharge groups and the least change in the DATOS methadone groups.

EXHIBIT V-1
TREATMENT EFFECTS ON ARRESTS BY STUDY AND MODALITY

	CALDATA			SROS			NTIES			DATOS		
Statistic	Percentage arrested, booked, or taken into custody			Percentage arrested			Percentage arrested and booked or taken into custody			Percentage arrested and booked or sent to juvenile court		
Reference Period	1 year			5 years			1 year			1 year		
Treatment Effect	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ
Short-Term Residential	34.2	11.2	**-67**	63.1	56.3	**-11**	42.5	15.6	**-63**	–	–	–
Long-Term Residential	39.3	12.6	**-68**	74.8	67.9	**-9**	42.1	16.1	**-62**	53	32	**-40**
Methadone	32.2	16.2	**-50**				34.6	20.6	**-41**	27	22	**-19**
Discharge	33.9	20.9	**-38**	67.9	60.8	**n.s.**	37.4	24.6	**-34**	–	–	–
Maintenance	27.3	4.8	**-82**	–	–	–	29.2	13.2	**-55**	–	–	–
Outpatient, Non-Methadone	28.5	9.8	**-66**	63.8	46.0	**-28**	39.6	16.0	**-60**	29	20	**-31**

Note: Differences are significant at $p<.05$ level, unless stated otherwise

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Exhibit V-2 summarizes the published findings from CALDATA, SROS, and NTIES on the percentages of clients who sold illegal drugs before and after treatment. (Note: DATOS included a comparable measure; however, the data for this measure have not been published.) In each study, there was a reduction in the percentage of clients who sold drugs during the reference period, both overall and within treatment modalities. Although pretreatment drug selling was two to three times more common in the NTIES study, the NTIES and CALDATA changes were very similar in the residential units (-75% to -80%) and in the methadone groups, albeit the discharged clients changed less (-55 and -65%) and maintenance clients changed more (-86% and -96%). The CALDATA outpatient clients had the least drug selling before treatment and changed less than the NTIES outpatients (-57% versus -79%). The SROS clients on the whole reported about half the level of reductions compared with CALDATA and NTIES.

2. EMPLOYMENT AND WELFARE

All studies collected data on the extent and duration of full-time employment, although the published DATOS measure was full-time employment *throughout* the reference period while the other three studies measured *any* full-time employment, yielding commensurately higher absolute figures (Exhibit V-3). There was more variability in these results among studies and treatment modalities than in any other outcome dimension measured, with CALDATA's results the worst and DATOS's the best; and methadone discharge the worst and long-term residential the best. More specifically, the CALDATA and SROS residential groups reported no significant employment changes, while in NTIES and DATOS, there were moderately positive changes in the short-term units (10% and 16%) and more appreciable ones in the long-term units (32% and 85%). In the outpatient groups, CALDATA reported negative change (-11%), SROS no change, and NTIES and DATOS positive change (18% and 34%). In a similar vein, the SROS and CALDATA discharge groups reported negative changes (-34% and -25%), the CALDATA maintenance group no change, the NTIES methadone groups small positive change (5%), and the DATOS group a larger positive change (34%).

EXHIBIT V-2
TREATMENT EFFECTS ON DRUG-SELLING BY STUDY AND MODALITY

	CALDATA			SROS			NTIES		
Statistic	Percentage sold drugs or helped someone else sell drugs, including cutting, weighing, packaging or making drugs			Percentage sold drugs or helped someone else sell drugs, including cutting, weighing, packaging, making or holding drugs, or having drug paraphernalia			Percentage sold drugs or helped someone else sell drugs, including cutting, weighing, packaging or manufacturing drugs		
Reference Period	1 year			5 years			1 year		
Treatment Effect	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ
Short-Term Residential	32.9	7.5	**-77**	34.7	23.3	**-33**	64.4	13.0	**-80**
Long-Term Residential	35.1	9.0	**-75**	45.2	26.6	**-41**	64.7	16.1	**-75**
Methadone	32.1	11.5	**-64**				74.2	18.2	**-76**
Discharge	31.7	14.2	**-55**	47.3	31.0	**-35**	73.0	25.2	**-65**
Maintenance	33.3	4.8	**-86**	–	–	–	76.4	5.0	**-94**
Outpatient, Non-Methadone	19.9	8.6	**-57**	28.4	23.1	**-19**	56.6	12.1	**-79**

Note: Differences are significant at $p<.05$ level, unless stated otherwise

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EXHIBIT V-3
TREATMENT EFFECTS ON FULL-TIME EMPLOYMENT BY STUDY AND MODALITY

	CALDATA			SROS			NTIES			DATOS		
Statistic	Percentage working full-time			Percentage employed full-time			Percentage receiving job income in past 12 months			Employed full-time during entire reference period		
Reference Period	1 year			5 years			1 year			1 year		
Treatment Effect	PRE	POST	CHG	PRE	POST	CHG	PRE	POST	CHG	PRE	POST	CHG
Short-Term Residential	43.2	47.1	**n.s**	75.3	71.4	**n.s**	58.4	67.9	**16**	33.0	36.2	**10**
Long-Term Residential	45.3	46.0	**n.s.**	80.0	76.7	**n.s.**	45.2	59.5	**32**	12.4	23.0	**85**
Methadone	35.6	26.7	**-25**				30.3	31.8	**n.s.**	15.1	18.2	**21**
Discharge	35.4	23.4	**-34**	76.6	57.8	**-25**	29.5	30.9	**n.s.**	–	–	–
Maintenance	36.2	34.7	**-n.s.**	–	–	–	31.9	33.5	**n.s.**	–	–	–
Outpatient, Non-Methadone	46.1	41.1	**-11**	73.3	78.6	**n.s.**	50.2	59.0	**18**	18.2	24.3	**34**

Note: Differences are significant at $p<.05$ level, unless stated otherwise

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CALDATA and NTIES collected and reported before/after data on receipt of welfare income (Exhibit V-4). There was little change in CALDATA; only the decline in methadone discharge clients (-13%) was significant. All of the NTIES groups changed significantly, but by modest amounts, ranging from a +6 percent increase in short-term residential to a -19 percent decrease in outpatient units.

3. PHYSICAL AND MENTAL HEALTH

All studies collected extensive data on physical and mental health, but only a limited base is available in the published results. CALDATA and SROS reported on changes in general health status using a standard four-point scale (from poor to excellent); NTIES and DATOS reported on those with limitations in work or other activities (see Exhibit V-5). The largest changes were reported in CALDATA, the smallest in SROS and NTIES, with DATOS in between. In the CALDATA residential units, despite the "social" rather than medical emphasis of the short-term modality, only half as many clients reported fair or poor health after treatment as before. The other studies reported declines of -12 percent to -18 percent in most cases, but no change in SROS long-term residential and a change of -31 percent in the DATOS short-term residential. In methadone, CALDATA and NTIES discharge groups reported no change, with other groups reporting -13 to -21 percent change in those with fair/poor health or disabling health conditions. Outpatient results ranged from no change in NTIES to -41 percent change in disabling conditions in DATOS.

Exhibit V-6 displays results from three studies concerning receipt of inpatient psychiatric treatment during the reference periods. The results are quite varied. There was only one statistically significant change in NTIES, a reduction in inpatient hospitalization among the outpatient drug treatment group. There were more changes in CALDATA, where the two residential groups reported reductions of -30 percent and -44 percent while the methadone discharge group reported a change of -53 percent. In SROS, two groups changed but in the opposite direction: the long-term residential and outpatient groups reported increased overnight mental health care (39% and 42%).

Rather than the mixed picture of results on mental health treatment, there was uniformity in the important mental health status measure of suicidal thoughts or attempts, reported in all four studies (Exhibit V-7). Nearly all groups reported significant reductions, excepting only the NTIES methadone groups where there was no change. The most substantial changes were among the NTIES short-term residential and both CALDATA residential client groups (-58%, -63%, -64%), with lower levels of change in the DATOS methadone group (-24%), and all others between -33 percent and -54 percent.

EXHIBIT V-4
TREATMENT EFFECTS ON WELFARE INCOME BY STUDY AND MODALITY

	CALDATA			SROS			NTIES			DATOS		
Statistic	Percentage who received welfare income			Data on percentage receiving welfare income were only asked post-treatment (past year).			Percentage receiving welfare income in past 12 months					
Reference Period	1 year			5 years			1 year					
Treatment Effect	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ			
Short-Term Residential	26.9	29.0	**n.s.**	—	—	—	25.2	26.7	**n.s.**			
Long-Term Residential	31.6	29.0	**n.s.**	—	—	—	54.1	49.1	**-9**			
Methadone				—	—	—	61.8	54.1	**-13**			
Discharge	30.8	26.8	**-13**	–	–	–	62.2	54.1	**-13**			
Maintenance	27.3	25.0	**n.s**	–	–	–	61.1	54.2	**n.s.**			
Outpatient, Non-Methadone	21.5	23.2	**n.s.**	—	—	—	42.4	34.2	**-19**			

Note: Differences are significant at $p<.05$ level, unless stated otherwise.

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EXHIBIT V-5
TREATMENT EFFECTS ON GENERAL HEALTH STATUS BY STUDY AND MODALITY

	CALDATA			SROS			NTIES			DATOS		
	During (MONTHS), would you say that your health was...excellent, good, fair, or poor?**% Fair or poor**			Now think about the 5 years before (DATE), would you say your health was excellent? Good? Fair? Or Poor? **% Fair or poor**			Health status at the time of interview limited ability to work **% somewhat or very much**			**% with limitations** in activities due to health for at least 90 days		
Time Frame:	1 year			5 years			1 year			1 year		
Treatment Effect	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ
Short-Term Residential	54.2	26.2	**-52**	40.6	34.8	**-14**	30.4	26.7	**-12**	36.5	25.1	**-31**
Long-Term Residential	52.6	27.0	**-49**	28.6	29.8	**n.s.**	29.5	24.5	**-18.**	29.1	24.9	**-14**
Methadone Discharge	52.6	41.8	**-21**	33.5	35.1	**n.s.**	55.0	46.6	**-15**	39.7	34.7	**-13**
Methadone Maintenance	54.7	51.5	**n.s.**				58.3	59.3	**n.s.**			
Outpatient, Non-Methadone	38.7	26.6	**-31**	28.6	24.8	**-13**	31.1	29.6	**n.s.**	28.4	16.8	**-41**

Note: Differences are significant at p<.05 level, unless stated otherwise.

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EXHIBIT V-6
TREATMENT EFFECTS ON PSYCHIATRIC HOSPITALIZATION BY STUDY AND MODALITY

	CALDATA			SROS			NTIES			DATOS
	During (MONTHS) did you stay overnight in a hospital or clinic for treatment of your emotions, nerves, or mental health?			In the 5 years before/after (DATE), did you stay overnight in a hospital or clinic for treatment of your emotions, nerves, or mental health, that wasn't the result of your alcohol or drug use?			Not including any drug or alcohol treatment, since (DATE) have you stayed somewhere for at least 24 hours for professional treatment of problems with your emotions, nerves, or mental health?			
Time Frame:	1 year			5 years			1 year			
Treatment Effect	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ	
Short-Term Residential	12.4	8.7	**-30**	7.6	9.4	**n.s.**	7.2	5.7	**n.s.**	
Long-Term Residential	12.4	6.9	**-44**	7.2	11.7	**+39**	8.0	5.9	**n.s.**	
Methadone Discharge	5.9	2.8	**-53**	5.7	5.0	**n.s.**	4.7	4.7	**n.s**	
Methadone Maintenance	3.3	1.0	**n.s.**				6.3	7.9	**n.s.**	
Outpatient, Non-Methadone	6.9	6.1	**n.s.**	4.9	8.5	**+42**	7.3	4.4	**-41**	

Note: Differences are significant at $p<.05$ level, unless stated otherwise

EXHIBIT V-7
TREATMENT EFFECTS ON SUICIDE ATTEMPTS BY STUDY AND MODALITY

	CALDATA			SROS			NTIES			DATOS		
	During (MONTHS), did you ever attempt suicide?			After (DATE), have you attempted suicide?			Since (DATE), have you attempted suicide?			Suicidal thoughts or attempts		
Time Frame:	1 year			5 years			1 year			1 year		
Treatment Effect	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ	PRE	POST	% Δ
Short-Term Residential	10.9	4.0	**-63**	17.3	10.0	**-42**	6.0	2.5	**-58**	31.0	16.3	**-47**
Long-Term Residential	11.9	4.3	**-64**	18.4	9.1	**-51**	4.9	3.0	**-38**	23.6	13.2	**-44**
Methadone Discharge	4.9	3.3	**-33**	13.7	6.3	**-54**	4.0	4.4	**n.s.**	16.6	12.7	**-24**
Methadone Maintenance	7.5	4.7	**-37**				3.5	4.8	**n.s.**			
Outpatient, Non-Methadone	6.8	4.1	**-40**	12.0	7.3	**-39**	4.1	2.5	**-39**	19.3	11.4	**-41**

Note: Differences are significant at $p<.05$ level, unless stated otherwise.

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VI. Implications for Treatment Research, Policy, and Practice

In this report we have taken an exploratory look at three aspects of the four large-scale studies of drug treatment outcomes that have taken place in the 1990s, namely the following:

- Methodological features including sample design, measurement, follow-up procedures, and response rates
- Treatment program and client population characteristics
- Outcome results, as measured by before/after differences on key dimensions of substance use and related behavior.

Because this is an exploratory study, it would be inappropriate to draw any direct conclusions for policy and practice from these results. However, the immediate research implications and downstream potential to inform policy and practice are very important.

There are several main methodological features of note. Two of the studies employed stratified random samples of treatment units and clients, interviewing clients once on a retrospective basis, while the other two are purposive, prospective, and involve repeated measures over time. The most visible result of these differences in terms of population parameters is that the purposive samples, reflecting a long-term Federal emphasis in its funding patterns and outcome research, have significantly more minority group members than the representative samples: roughly two-thirds rather than 40 percent. If there were substantial ethnic- or race-related differences in response to treatment, this would comprise a significant issue in generalizing from the results of purposive studies. Although study results that are not the direct focus of this report indicate significant differences by race and ethnicity in some pretreatment characteristics, particularly primary drug, there do not appear to be substantial enough differences in the response to treatment by corresponding population subgroups to assign high concern to this matter. Nevertheless, future studies must remain alert to departures from representativeness, an issue discussed in more detail in a companion NEDS paper (Johnson, & Gerstein, 1999)

Three studies have fairly similar reference periods of about a year before and after treatment for most outcome measures, while the fourth, SROS, covers much longer periods of 5 years before and after—although it does include numerous measures that index the past year only, similar to the other studies. The particular variables best suited to measure before/after

change in SROS are evidently different from those appropriate to the shorter term studies, which makes direct comparisons of such changes more difficult. However, SROS, with its lengthier time span and national probability sampling frame, should prove valuable as a calibrator or adjuster for some of the results of the other studies. SROS can provide, for example, a useful way to evaluate the core analytic assumption that, in the absence of treatment, adult respondents would display fairly stable population parameters on key outcome variables between the 1-year reference periods—in effect, the null hypothesis with regard to behavioral change in the absence of treatment.

A 5-year follow-up data collection has recently been completed with a subset of the DATOS respondents, and comparisons between the 5-year DATOS and SROS data would be very useful. In the same vein, longer term follow-ups of CALDATA, which has the most complete sampling frame, or NTIES, which has the best follow-up and multi-stage response rates, would substantially enrich the possibilities of examining treatment careers and treatment outcomes with both short-term and long-term measures of change.

Comparably computed measures of response rates indicate remarkably similar multi-stage sample completion rates for three of the studies, with NTIES a notch above the other two, but an appreciably lower rate for the fourth study, DATOS. All of the field work for the studies was performed separately or in combination with two research organizations, RTI and NORC. Both organizations have published experience in performing large-scale, geographically distributed substance abuse treatment outcome studies. DATOS was the only one of the four carried out entirely by the first research organization, but a similar difference between the two organizations was recorded in the jointly performed NTIES. The explanation for the lower DATOS rates lies partly in design decisions but appears mostly to reflect less aggressive or effective follow-up procedures rather than differences in resource levels or any other circumstances of the research. An important issue for further comparison is whether these differential completion and response rates lead to any differences in results beyond the inevitable reductions in precision that result from smaller follow-up sample sizes.

Across the outcome domains of drug use, crime, income, and health, several findings strongly invite further intensive study. Clients in short-term and long-term residential treatment appear to experience positive changes in drug use, crime, employment, and health more often than do clients in outpatient treatment modalities. Since populations of residential clients differ in many respects from outpatient groups, this result does not necessarily translate to intrinsic advantages in program quality or effectiveness in residential (and inpatient) treatment settings.

Nevertheless, this result addresses a very important debate about the allocation of resources to different types of treatment, and demands more extensive study across these data sets, which are especially rich in both nonmethadone outpatient and long-term residential programs.

Clients who have been discharged from (rather than maintained on) methadone appear, in general, to display positive changes less often than any other group in treatment. This confirms widely accepted information about this well-studied type of treatment. More detailed combing of data on methadone SDUs and clients in these four studies may shed new light on the reasons why such a large percentage of methadone patients are discharged rather than maintained.

Finally, employment and welfare utilization appear to change less often than any other outcome measures. These outcome measures are no doubt the least central of all the ones reviewed here to the mission and service focus of most treatment programs, and they are perhaps the most affected by systematic external variations such as the business cycle and public policy decisions. Nevertheless, further attention is needed to understand these results, such as division of the treatment population by pretreatment work experience and related economic variables

In general, the findings of this exploratory analysis suggest that at least three of the studies are comparable enough to permit continued joint exploration, including the possibility of pooling cases to some extent to permit more sophisticated multivariate studies. As the public use files of all the sets become available, researchers will not be limited to comparing published items but can use the full range of outcome and process variables available in the respective sets of research instruments. The addition of a DATOS 5-year follow-up to SROS, and the possibility of adding longer term follow-up data on the other study cohorts provide additional opportunities to turn these research investments into knowledge that can inform policy and practice.

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APPENDIX

DESCRIPTION OF THE NATIONAL TREATMENT IMPROVEMENT EVALUATION STUDY AND CENTER FOR SUBSTANCE ABUSE TREATMENT DEMONSTRATIONS (1990-1992)

The National Treatment Improvement Evaluation Study (NTIES) was a national evaluation of the effectiveness of substance abuse treatment services delivered in comprehensive treatment demonstration programs supported by the Center for Substance Abuse Treatment (CSAT). The NTIES project (1992-1997) was designed and performed for CSAT by the National Opinion Research Center at the University of Chicago with assistance from Research Triangle Institute. The NTIES project collected longitudinal data between FY 1992 and FY 1995 on a purposive sample of clients in treatment programs receiving demonstration grant funding from CSAT. Client-level data were obtained at treatment intake, at treatment exit, and 12 months after treatment exit. Service delivery unit (SDU) administrative and clinician (SDU staff) data were obtained at two time points, 1 year apart.

1. THE NTIES DESIGN

1.1 The Administrative/Services Component

The NTIES study design had two levels—an administrative or services component and a clinical treatment outcomes component. The administrative component was designed to assess how CSAT demonstration funds were used, what improvements in services were implemented at the program level, and what kind and how many programs and clients were affected by the demonstration awards. Four data collection instruments were used to gather administrative/services data: the NTIES Baseline Administration Report (NBAR), the NTIES Continuing Administrative Report (NCAR), the NTIES Exit Log, and the NTIES Clinician Form (NCF).

The unit of analysis for the administrative component was the SDU, defined by CSAT as a single site offering a single level of care. The classification of *level of care* is based on three parameters:

- Facility type (e.g., hospital, etc.)
- Intensity of care (e.g., 24-hour, etc.)
- Type of service (e.g., outpatient, etc.).

An SDU could be a stand-alone treatment provider, or it could be one component of a multi-tiered treatment organization. For example, a large, county mental health agency may be the *organization* within which the SDU is located. The organization may have multiple substance abuse treatment components, such as a county hospital and a county (ambulatory) mental health center. The county hospital may have multiple SDUs, such as an inpatient detoxification service, an outpatient counseling service, and a hospital satellite center providing transitional care. In summary, the SDU provided NTIES evaluators with a stable, uniform level of comparison for examining service delivery issues.

A range of key clinician-specific data elements (within the administrative component) were assessed using the NCF. The NCF items were an important adjunct to the facility- (SDU) level instruments; these items assessed clinician training, experience, client exposure, and service provision, and were completed by all counseling and clinical (medical and therapeutic) staff at the individual SDUs.

1.2 Clinical Treatment Outcomes Component

The unit of analysis for the clinical treatment outcomes component was individual client data. NTIES measured the clinical outcomes of treatment primarily through a "before/after" or "pre- to post-treatment" design. This method compares behaviors or other individual characteristics in the same participants, measured in similar ways, before and after an intervention.

Information about clients' lives for the *before* period were obtained from the NTIES Research Intake Questionnaire (NRIQ), which was administered sometime during the clients' first 3 weeks of treatment. The specific areas assessed included:

- Drug and alcohol use
- Employment
- Criminal justice involvement and criminal behaviors
- Living arrangements
- Mental and physical health.

Information about clients' lives for the *after* period were obtained from the NTIES Post-discharge Assessment Questionnaire (NPAQ), with the same areas assessed at roughly 12 months post-treatment. Other client data sources included a treatment discharge interview (NTIES Treatment Experience Questionnaire, NTEQ), abstracted client records, urine drug screens collected at the time of the follow-up interview, and arrest reports from state databases.

1.3 The Outcome Analysis Sample

Between August 1993 and October 1994, research staff successfully enrolled 6,593 clients at 71 SDUs to participate in three waves of an in-person, computer-assisted data collection protocol. These SDUs were chosen from the universe of treatment units receiving demonstration grant funding from CSAT. Some of the selected facilities were wholly supported by CSAT awards, while others received only indirect support or none.

Clients were interviewed three times: shortly after admission on their first day of treatment, when they left treatment, and 12 months after the end of treatment. Less than 10 percent of the eligible clients refused or avoided participation, and more than 83 percent of the recruited individuals (5,388 clients) completed a follow-up interview. Additional sample exclusions included:

- Missing or undetermined treatment exit date
- Inappropriate length of follow-up interval (less than 5 or more than 16 months)
- Clients incarcerated for most or all of the follow-up period (nearly all had been treated while incarcerated, and were not yet released).

The additional sample exclusions resulted in a final outcome analysis sample of 4,411 individuals.

2. TREATMENT DEMONSTRATION PROGRAMS

CSAT initiated three major demonstration programs and made 157 multi-year treatment enhancement awards across 47 states and several territories during 1990 through 1992. One objective common to all demonstrations was CSAT's emphasis on the provision of "comprehensive treatment" services to targeted client populations. The recipients of these awards focused special attention on the substance abuse treatment service needs of minority and

special populations located primarily within large metropolitan areas. The demonstration programs are briefly described below.

2.1 Target Cities

Under this demonstration, nine metropolitan areas were selected to receive awards, of which half were included in the NTIES purposive sample. The following treatment improvement activities were explicitly provided for in the awards:

- Establishment of a Central Intake Unit (CIU) with automated client tracking and referral systems in place
- Provision of comprehensive services, including vocational, educational, biological, psychological, informational, and lifestyle components
- Improved inter-agency coordination (e.g., mental health, criminal justice, and human service agencies)
- Services for special populations—adolescents, pregnant and postpartum women, racial and ethnic minorities, and public housing residents.

2.2 Critical Populations

Under this demonstration program, awardees were required to implement "model enhancements" to existing treatment services for one or more of the following critical populations: racial and ethnic minorities, residents of public housing, and/or adolescents. Special emphasis was given to services provided to the homeless, the dually diagnosed, or persons living in rural areas. A total of 130 grants were awarded, covering services such as vocational support/counseling, housing assistance, integrated mental health and/or medical services, coordinated social services, culturally directed services, and others.

2.3 Incarcerated and Non-Incarcerated Criminal Justice Populations

Under this demonstration program, funds were directed toward improving the standard of comprehensive treatment services for criminally involved clients in correctional and other settings. Some program emphasis was placed on ethnic and/or racial minorities. Nine correctional setting demonstrations were funded: five in prisons, three in local jails, and one across a network of juvenile detention facilities. All projects included a screening component to

identify substance-abusing inmates, a variety of targeted treatment interventions (e.g., therapeutic communities, intensive day treatment programs), and a substantial aftercare component.

A total of 10 non-incarcerated projects were funded. Five programs targeted interventions at clients in diversionary programs, three focused services on probationers or parolees, and two programs targeted both populations. Almost all of the funded demonstration projects included the following components:

- Basic eligibility determination, followed by systematic screening and assessment
- Referral to treatment
- Graduated sanctions and incentives while in treatment
- Intensive supervision in treatment
- Community-based aftercare with supervision and service coordination.

In total, 19 criminal justice projects were funded as part of the CSAT 1990-1992 demonstrations, and as indicated in the next section, these projects were purposively over-sampled in order to obtain a more robust evaluation of this program.

3. DESCRIPTION OF SDUS AND CLIENTS BY TREATMENT MODALITY AND PROGRAM TYPE

The 71 SDUs contributing clients to the outcome analysis sample are characterized by modality and (demonstration) program type in Exhibit A-1 below. Among the 698 SDUs in the NTIES universe: 52 percent (n=365) were Target Cities programs, 39 percent (n=274) were Critical Populations programs, and 9 percent (n=59) were Criminal Justice programs.

In terms of the SDUs sampled for the NTIES outcome analysis, 44 percent were Target Cities programs, 38 percent were Critical Populations programs, and 23 percent were Criminal Justice programs. Criminal Justice SDUs were purposely over-sampled as part of the NTIES evaluation design (CSAT, 1997). Nearly half of the sampled SDUs were (non-methadone) outpatient programs, and about one-quarter were long-term residential programs.

EXHIBIT A-1
SDUs IN THE OUTCOME ANALYSIS SAMPLE

Program Title Number of SDUs (% of NTIES Universe)[1]	**NTIES Sample**	**Methadone**	**Outpatient**	**Long-Term Residential**	**Short-Term Residential**	**Correctional**
Target Cities n=365 (52%)	31 (44%)	6	15	6	4	0
Critical Populations n=274 (39%)	27 (38%)	1	13	10	3	0
Criminal Justice n=59 (9%)	13 (23%)	0	5	0	0	8
Totals N=698 (100%)	71 (100%)	7	33	16	7	8

EXHIBIT A-2
DISTRIBUTION OF CLIENTS IN THE OUTCOMES ANALYSIS SAMPLE

Program Title Number of Clients (% of Analysis Sample)	**Methadone**	**Outpatient**	**Long-Term Residential**	**Short-Term Residential**	**Correctional**
Target Cities n=2,600 (59%)	377 (89%)	1,214 (78%)	504 (60%)	505 (58%)	0
Critical Populations n=931 (21%)	45 (11%)	220 (14%)	298 (35%)	368 (42%)	0
Criminal Justice n=880 (20%)	0	132 (8%)	39 (5%)	0	709 (100%)
Totals n=4,411 (100%)	422	1,566	841	873	709

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[1] The original NTIES universe of SDUs included a program type called *Specialized Services*. Because clients for the outcome analysis sample were not drawn from these SDUs (n=94), they are excluded from the Exhibit.

As shown in Exhibit A-2, 59 percent of all NTIES clients were sampled from Target Cities SDUs. Slightly over 21 percent of all NTIES clients were sampled from Critical Populations SDUs, and 20 percent were sampled from Criminal Justice SDUs. Outpatient (non-methadone) SDUs treated over one-third (35%) of the clients in the outcomes analysis sample, and almost 80 percent of these were sampled from Target Cities programs.

Readers who are interested in more detailed information about the NTIES project are invited to visit the NEDS Web site at: http://neds.calib.com. The NEDS Web site provides the full-length version of the NTIES Final Report (1997), as well as copies of all data collection instruments employed in NTIES.